CLAIMS

1. An injector device (10, 110, 210) for transcutaneously placing a hollow cannula (26, 126, 226) of a subcutaneous infusion set (14, 114, 214) through the skin of a patient, comprising:

a device housing (28, 128, 228) having an elongated bore formed therein,

a plunger (30, 130, 230) slidably received within the bore for movement between an advanced position and a retracted position, the plunger (30, 130, 230) having substantially non-detachably secured thereto an insertion needle (12, 112, 212) for receiving and supporting the cannula (26, 126, 226) of said subcutaneous infusion set (14, 114, 214) in a position with the cannula (26, 126, 226) oriented for transcutaneous placement upon movement of the plunger (30, 130, 230) with said needle (12, 112, 212) from the retracted position to the advanced position,

a drive for urging the plunger (30, 130, 230) with a controlled force and speed from the retracted position toward the advanced position to transcutaneously place said cannula (26, 126, 226) of said subcutaneous infusion set (14, 114, 214) received on said insertion needle (12, 112, 212),

wherein the insertion needle (12, 112, 212) secured to said plunger (30, 130, 230) is removable from said cannula (26, 126, 226) while maintaining the transcutaneous placement of the cannula (26, 126, 226).

2. The injector device of claim 1, wherein the device housing (28, 128, 228) has a forward end defining a generally planar surface (25, 125, 225) for placement against the skin of a patient with the device housing (28, 128, 228) in a predetermined orientation relative to the patient's skin.

3. The injector device of claim 1, wherein a forward end (12A, 112A, 212A) of said insertion needle (12, 112, 212) opposite said plunger (30, 130, 230) is

substantially retracted within the bore of the device housing (28, 128, 228) when the plunger (30, 130, 230) is in the retracted position.

4. The injector device of claim 2, wherein the infusion set (14, 114, 214) comprises a tubing (113), said injector device including an annular space (115) between said device housing (28, 128, 228) and said plunger (30, 130, 230) for accommodating said tubing (113).

5. The injector device of claim 1, further including a trigger for actuating the drive.

6. The injector device of claim 5, wherein the trigger includes a trigger actuator for fingertip depression to actuate the drive for movement of the plunger (30, 130, 230) from the retracted position to the advanced position.

7. The injector device of claim 5, wherein the trigger includes a lock (58, 158, 258) for releasably locking the plunger (30, 130, 230) in the retracted position.

8. The injector device of claim 1, wherein the device housing (28, 128, 228) and the plunger (30, 130, 230) include cooperatively engageable track means for guiding movement of the plunger (30, 130, 230) between the advanced and retracted positions.

9. The injector device of claim 1, wherein the insertion needle (12, 112, 212) is substantially incapable of delivering a fluid.

10. The injector device of claim 1, wherein the plunger (30, 130, 230) head (32, 132, 232) further includes a safety retainer for retaining the hollow cannula (26, 126, 226) on said insertion needle (12, 112, 212), the safety retainer permitting separation of the cannula (26, 126, 226) from said insertion needle (12, 112, 212) when the plunger (30, 130, 230) head is in the advanced position.

11. The injector device of claim 1, said cannula (26, 126, 226) being soft and flexible.

12. The injector device of claim 1, wherein the drive comprises a spring (36, 136, 236) for moving the plunger (30, 130, 230) from the retracted position to the advanced position.

13. The injector device of claim 12, wherein the spring (136) comprises a number of individual, elongated flexible plastics strips extending around a respective part of the periphery of the plunger (130), in an annular space (115) between the plunger (130) and the device housing (128), each strip being connected with the plunger (130) and with the device housing (128).

14. The injector device of claim 13, wherein the strips are integrally molded with said plunger (130) and said device housing (128).

15. The injector device of claim 13, wherein each strip is connected at one end (136') with the plunger (30, 130, 230) and with the device housing (28, 128, 228) at the other end (136"), each strip being essentially plane and non-deformed in the advanced position of the plunger (30, 130, 230).

16. The injector device of claim 1, further including a cover (42, 142, 227) at a forward end of the device housing (28, 128, 228) for covering an infusion set (14, 114, 214) received on said insertion needle (12, 112, 212) and for covering said insertion needle (12, 112, 212) subsequent to removal of said infusion set (14, 114, 214).

17. The injector device of claim 1, said device housing having a flat, box-shaped configuration.

18. An injector device assembly, comprising:

an infusion set (14, 114, 214) including a housing and a hollow cannula (26, 126, 226),

a device housing (28, 128, 228) having an elongated bore formed therein,

a plunger (30, 130, 230) slidably received within the bore for movement between an advanced position and a retracted position, the plunger (30, 130, 230) having substantially non-detachably secured thereto an insertion needle (12, 112, 212) carrying said cannula (26, 126, 226) with the cannula (26, 126, 226) oriented for transcutaneous placement upon movement of said plunger (30, 130, 230) from the retracted position to the advanced position,

a spring for urging said plunger (30, 130, 230) toward the advanced position, and

a trigger for releasably retaining the plunger (30, 130, 230) in the retracted position, the trigger being operable to release the plunger (30, 130, 230) for spring-loaded movement with a controlled force and speed toward the advanced position,

wherein the insertion needle (12, 112, 212) secured to said plunger (30, 130, 230) is removable from said cannula (26, 126, 226) while maintaining the transcutaneous placement of the cannula (26, 126, 226).

19. The injector device assembly of claim 18, wherein the plunger (30, 130, 230) further includes a safety retainer for retaining the hollow cannula (26, 126, 226) on said insertion needle (12, 112, 212), the safety retainer permitting separation of the cannula (26, 126, 226) from said insertion needle (12, 112, 212) when the plunger (30, 130, 230) head is in the advanced position.

20. The injector device assembly of claim 18, wherein the device housing (28, 128, 228) has a forward end defining a generally planar surface of placement against the skin of a patient with the device housing (28, 128, 228)

in a predetermined orientation relative to the patient's skin.

21. The injector device assembly of claim 18, wherein the device housing (28, 128, 228) and the plunger (30, 130, 230) include cooperatively engageable track means for guiding movement of the plunger (30, 130, 230) between the advanced and retracted positions.

22. The injector device assembly of claim 18 wherein releasable cover members (94, 194, 227, 42, 142) cover at least one end of the device housing (28, 128, 228) for assuring sterile conditions prior to use of the injector device assembly.

23. The injector device assembly of claim 18, wherein the spring comprises a number of individual, elongated flexible plastics strips (136) extending around a respective part of the periphery of the plunger (130), in an annular space (115) between the plunger (130) and the device housing (128), each strip being connected with the plunger (130) and with the device housing (128).

24. The injector device assembly of claim 18, wherein the strips (136) are integrally molded with said plunger (130) and said device housing (128).

25. An injector device, comprising:

a molded device housing having an elongated bore formed therein,

a molded plunger slidably received within the bore for movement between an advanced position and a retracted position,

a spring for urging the plunger with a controlled force and speed from the retracted position toward the advanced position,

wherein the drive comprises a number of individual, elongated flexible plastics members (136), each member being connected with the plunger and

with the device housing, each of said members being integrally molded with said plunger and said device housing.

26. The injector device of claim 25, wherein each of said elongated flexible plastics members is connected at one end (136') with the plunger and with the device housing at the other end (136"), each member being essentially plane and non-deformed in the advanced position of the plunger.

27. The injector device of claim 25 wherein each member (136) is formed as a strip, the device including at least two such strips, each strip extending around a respective part of the periphery of the plunger (30, 130, 230).

28. The injector device of claim 25, each of said members (137) extending in an annular space between the plunger (30, 130, 230) and the device housing (28, 128, 228).

29. The injector device of claim 25, used for transcutaneously placing an insertion needle of a subcutaneous infusion set through the skin of a patient, wherein the plunger includes a support structure for mated slide-fit reception and support of the infusion set in a position with the insertion needle thereof oriented for transcutaneous placement upon movement of said plunger from the retracted position to the advanced position, wherein the support structure is removable from the infusion set while maintaining the transcutaneous placement of the insertion needle.

30. The injector device of claim 25, used for transcutaneously placing a subcutaneous infusion set through the skin of a patient by means of an insertion needle, wherein said insertion needle is substantially non-detachably secured to said plunger, and wherein said insertion needle receives and supports the cannula of the infusion set in a position with the cannula oriented for transcutaneous placement upon movement of said plunger from the retracted position to the advanced position, wherein the insertion needle is removable from the infusion set while maintaining the transcutaneous placement of the cannula.